

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 April 2004 (22.04.2004)

PCT

(10) International Publication Number
WO 2004/033956 A1

(51) International Patent Classification⁷: **F17D 3/01**

(21) International Application Number:
PCT/US2003/032438

(22) International Filing Date: 10 October 2003 (10.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/418,137 11 October 2002 (11.10.2002) US

(71) Applicant (for all designated States except US): SAUDI
ARABIAN OIL COMPANY [SA/SA]; R-3296, Admin-
istration Building, Dhahran 31311 (SA).

(72) Inventors; and

(75) Inventors/Applicants (for US only): TUIN, Rienk
[NL/SA]; 328 Prairie View Court, Dhahran 31311
(SA). ELANDERS, Patrick, S. [US/SA]; 232 Rainbow,
Dhahran 31311 (SA).

(74) Agent: CINAMON, Jay, S., Abelman Frayne & Schwab,
150 East 42nd Street, New York, NY 10017-5612 (US)

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

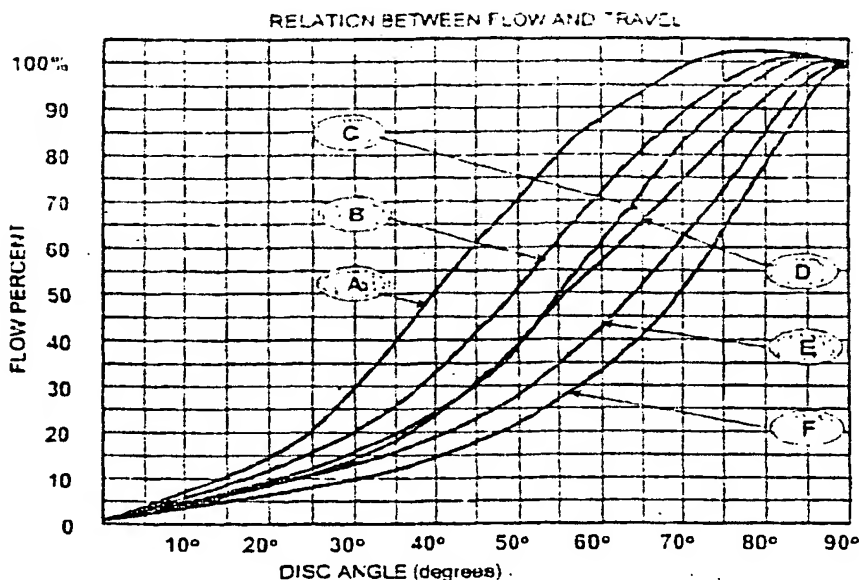
(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: AUTOMATIC VALVE CHARACTERIZATION OF DIGITAL VALVE POSITIONERS



(57) Abstract: A digital valve positioner is controlled to automatically characterize a valve to provide a linear relationship between

WO 2004/033956 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/32438

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F17D 3/01

US CL : 251/129.04; 137/1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 251/129.04; 137/1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,202,680 B1 (IROKAWA et al) 20 March 2001 (20.03.2001), column 2, line 15 - column 5, line 67.	1-20
Y	US 6,155,283 A (HANSEN et al) 05 December 2000 (05.12.2000), column 3, line 12 - column 12, line 9.	1-20
Y	US 5,878,765 A (LANGE) 09 March 1999 (09.03.1999), column 3, line 7 - column 6, line 37.	1-20
Y	US 5,190,068 A (PHILBIN) 02 March 1993 (02.03.1993), column 2, line 55 - column 6, line 7.	1-20
Y	US 4,926,903 A (KAWAI) 22 May 1990 (22.05.1990), column 6, line 50 - column 15, line 25.	1-20

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

23 February 2004 (23.02.2004)

Date of mailing of the international search report

26 MAR 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Gene Mancene

Telephone No. (703) 308-0975